

ABSTRACT OF THE DISCLOSURE

A diamond electron emission element is provided with a substrate, and a plurality of quadrangular columns (microscopic projections) composed of diamond and with side faces of flat faces, which are arranged at equal intervals on the substrate. A top end face (horizontal section) is of a quadrangular shape having a length of long sides being a [nm] and a length of short sides being ka [nm], and a thin film of SiO_2 is formed on a side face on the short-edge side. The length a [nm] of long sides and the length ka [nm] of short sides satisfy relational expressions of Formulae (1) and (2) below.

$$C_1 = 2a\sqrt{1+k^2} \dots (1)$$

$$n\lambda = C_1 \dots (2)$$

C_1 : a distance [nm] of a lap in a situation where light generated inside each quadrangular column goes around on a specific circuit while being reflected on the side faces of the quadrangular column,

n : an arbitrary positive integer, and

λ : an emission peak wavelength λ [nm] of the diamond making the quadrangular columns.